



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

DEVAL L. PATRICK
Governor

MAEVE VALLELY BARTLETT
Secretary

DAVID W. CASH
Commissioner

August 6, 2014

Mr. Ken Jones
E-Ink Corporation
1000 Technology Park Drive
Billerica, Massachusetts 01821

RE: BILLERICA
Transmittal No.: X260351
Application No.: *NE-14-008*
Class: *SM50*
FMF No.: *543034*
**AIR QUALITY PLAN
APPROVAL**

Dear Mr. Jones:

The Massachusetts Department of Environmental Protection ("MassDEP"), Bureau of Waste Prevention, has reviewed your Limited Plan Application ("Application") listed above. This Application concerns the addition of a new research spray coater at your existing facility located at 1000 Technology Park Drive, Billerica, Massachusetts ("Facility").

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control," regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-J, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator ("Permittee") must comply in order for the Facility to be operated in compliance with this Plan Approval.

1. DESCRIPTION OF FACILITY AND APPLICATION

The Permittee currently operates a research and development facility at 1000 Technology Park Drive, Billerica, Massachusetts, under a Limited Plan Application Approval, Application No. NE-13-005, which was issued by MassDEP to you on June 17, 2013. The existing Facility focuses on research and development of electronic paper display materials by testing and developing new applications and technologies.

The existing process operations were categorized into one of three emission unit categories. Emission Unit No. 1A (EU 1A) involves general cleaning operations where equipment is cleaned using various solvent based cleaners. EU 1B consists of Internal Phase and Encapsulation operations where pigments are be mixed with various solvents prior to being transferred to a closed system where other chemicals and solvents are added in closed reactor vessels. EU 1C involves development and testing of various pigments prior to commercial production at other facilities.

The proposed research spray coater (EU 1E) will be used to apply coatings onto substrates such as plastic or glass. There will also be an expansion of the Research Advanced Development department that will take place under lab hoods (EU 1D).

2. EMISSION UNIT (EU) IDENTIFICATION

Each Emission Unit (EU) identified in Table 1 is subject to and regulated by this Plan Approval:

Table 1		
EU#	Description	Pollution Control Device (PCD)
EU 1A	General Cleaning Operations	None
EU 1B	Internal Phase and Encapsulation	
EU 1C	Research Advanced Development (Pigment and Ink Development)	
EU 1D	Research Advanced Development (Under Hood)	
EU 1E	Research Spray Coater	The spray coater shall utilize dry fiber mat filter with a total thickness of at least two inches that achieves a particulate control efficiency of at least 97% by weight.

Table 1 Key:

EU# = Emission Unit Number

PCD = Pollution Control Device

3. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION AND EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2, below:

Table 2			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
EU 1A	N/A	VOC	0.4 TPM 2.0 TPY
		Total HAPs	0.1 TPM 0.4 TPY
EU 1B		VOC	0.5 TPM 2.7 TPY
		Total HAPs	0.1 TPM 0.4 TPY
EU 1C		VOC	0.6 TPM 2.8 TPY
		Total HAPs	0.8 TPM 4.2 TPY
EU 1D		VOC	0.2 TPM 1.0 TPY
		Total HAPs	0.2 TPM 1.0 TPY
EU 1E		VOC	0.2 TPM 1.0 TPY
		Total HAPs	0.2 TPM 1.0 TPY
Facility- wide	N/A	VOC	1.9 TPM 9.5 TPY
		Total HAPs	1.4 TPM 7.0 TPY
		HOC	0.2 TPM 1.0 TPY
		PM	0.2 TPM 1.0 TPY

Table 2 Key:

EU# = Emission Unit Number

VOC = Volatile Organic Compounds

Total HAPs = Total Hazardous Air Pollutants

PM = Total Particulate Matter

HOC = Halogenated Organic Compounds

TPM = tons per month

TPY = tons per consecutive 12-month period

N/A = Not Applicable

B. COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5 below:

Table 3	
EU#	Monitoring and Testing Requirements
EU 1A, EU 1B, EU 1C, EU 1D, EU 1E	1. Monitor material usage (including VOC, HAPs, HOC, and solids content of all materials used) on a monthly basis such that records can be maintained of the Facility's emissions of VOC, total HAPs, HOC, and PM to determine compliance status with the emission limits contained in Table 2 above.
EU 1E	2. Monitor pressure drop across the spray booth and replace dry mat filters as required by the Standard Operating and Maintenance Procedures (SOMP) of the manufacturer.
Facility-wide	3. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with USEPA Reference Test Methods and Regulation 310 CMR 7.13.

Table 3 Key:

EU# = Emission Unit Number

VOC = Volatile Organic Compounds

Total HAPs = total Hazardous Air Pollutants

HOC = Halogenated Organic Compounds

PM = Total Particulate Matter

MassDEP = Massachusetts Department of Environmental Protection

USEPA = United States Environmental Protection Agency

Table 4	
EU#	Record Keeping Requirements
EU 1A, EU 1B, EU 1C, EU 1D, EU 1E	1. Maintain records of material usage (including VOC, HAPs, HOC, and solids content of all materials used) on a monthly basis such that records can be maintained of the Facility's emissions of VOC, total HAPs, HOC, and PM to determine compliance status with the emission limits contained in Table 2 above.
EU 1E	2. Maintain records of the pressure drop across the spray booth on a daily basis (prior to the commencement of any spraying operations) and record when the dry mat filters have been replaced.

Table 4	
EU#	Record Keeping Requirements
Facility-wide	3. The Permittee shall maintain adequate records on-site to demonstrate compliance with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve month period (current month plus prior eleven months). These records shall be compiled no later than the 15 th day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping .
	4. The Permittee shall maintain records of monitoring and testing as required by Table 3.
	5. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EUs approved herein on-site.
	6. The Permittee shall maintain a record of routine maintenance activities performed on the approved EUs and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.
	7. The Permittee shall maintain a record of all malfunctions affecting air contaminant emission rates of the approved EUs and monitoring equipment. At a minimum, the records shall include: date and time the malfunction occurred; description of the malfunction; corrective actions taken; the date and time corrective actions were initiated and completed; and the date and time emission rates and monitoring equipment returned to compliant operation.
	8. Maintain records of Facility operations such that information may be reported as required for compliance with 310 CMR 7.12.
	9. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years.
	10. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request.

Table 4 Key:

EU# = Emission Unit Number

EUs = emission units

SOMPs = Standard Operating and Maintenance Procedures

MassDEP = Massachusetts Department of Environmental Protection

USEPA = United States Environmental Protection Agency

Table 5	
EU#	Reporting Requirements
Facility-wide	1. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a “Responsible Official” as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	2. The Permittee shall notify the Northeast Regional Office of MassDEP, BWP Permit Chief by email at nero.air@state.ma.us or fax 978-694-3499 as soon as possible, but no later than one (1) business day after discovery of any exceedance(s) of Table 2 requirement(s). A written report shall be submitted to the BWP Permit Chief within three (3) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).
	3. The Permittee shall provide a copy to MassDEP of any record required to be maintained by this Plan Approval within 30 days from MassDEP’s request.
	4. The Permittee shall submit to MassDEP for approval a stack emission pretest protocol, at least 60 days prior to emission testing, for any emission testing as defined in Table 3 Monitoring and Testing Requirements.
	5. The Permittee shall submit to MassDEP a final stack emission test results report, within 45 days after emission testing, for any emission testing as defined in Table 3 Monitoring and Testing Requirements.
	6. The Permittee shall submit a Source Registration/Emission Statement form to MassDEP in accordance with the requirements of 310 CMR 7.12.

Table 5 Key:

EU# = Emission Unit Number

CMR = Code of Massachusetts Regulations

MassDEP = Massachusetts Department of Environmental Protection

BWP = Bureau of Waste Prevention

3. SPECIAL TERMS AND CONDITIONS

The Permittee is subject to, and shall comply with, the following special terms and conditions:

- A. The Permittee shall comply with the Special Terms and Conditions as contained in Table 6 below:

Table 6	
EU#	Special Terms and Conditions
EU 1A, EU 1B, EU 1C, EU 1D, EU 1E	1. The Permittee shall follow the Standard Operating and Maintenance Procedures (SOMPs) for the subject emission units so as to maintain their efficient operation and minimize emissions of VOC, HOC, and total HAPs.
EU 1E	2. The spray booth shall utilize two or more layers of dry fiber mat filter with a total thickness of at least two inches or an equivalent system as determined in writing by MassDEP and that achieves a particulate control efficiency of at least 97 percent (%) by weight. Filter material shall be disposed of in accordance with all applicable MassDEP regulations. In addition, the face velocity of air at each filter shall not exceed 200 feet per minute.
	3. For non-plastic surface preparation, prior to coating, the VOC content of any surface preparation solution shall not exceed 1.67 pounds per gallon. This requirement is not applicable to cleanup solutions which are re-used as thinners/reducers for coatings. For surface preparation of plastic parts, the VOC content of the surface preparation solution shall not exceed 6.5 pounds of VOC per gallon.
Facility-wide	4. All cleaning rags used in conjunction with cleaning solutions shall be placed in tightly covered containers when not in use, and shall be collected for proper recycling or disposal.
	5. All VOC, HOC, and HAPs containing materials, such as solvents, inks, and clean-up solutions, shall be transported and stored in tightly covered containers. Any emissions associated with surface preparation and /or cleanup solutions shall be included in the monthly and 12 month rolling emissions calculations to determine the Permittee's compliance status with emission limits contained in Table 2 above.
	6. This Plan Approval, NE-14-008, supersedes the Final Approval, NE-13-005, issued to the Permittee on June 17, 2013, in its entirety, with the exception that all plan application materials submitted as part of Approval NE-13-005 become part of Plan Approval No. NE-14-008.

Table 6 Key:

EU# = Emission Unit Number

- B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including but not limited to rain protection devices known as "shanty caps" and "egg beaters". The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7 below, for the Emission Units that are regulated by this Plan Approval:

Table 7				
EU#	Stack Height Above Roof	Stack Inside Exit Dimensions	Stack Gas Exit Velocity	Stack Gas Exit Temperature Range
EU 1B ^[1]	11 feet	18 inch diameter	50 feet per second	68 °F – 98 °F
EU 1C ^[1]	11 feet	10 inch diameter	50 feet per second	68 °F – 98 °F
EU 1D ^[1]	10 feet	18 inch diameter	50 feet per second	68 °F – 98 °F
EU 1E	10 feet	18 inch diameter	40 feet per second	68 °F – 98 °F

Table 7 Key:

EU# = Emission Unit Number

°F = Degrees Fahrenheit

Table 7 Notes: ^[1] Each of these emission units are associated with multiple stacks. Each stack meets the minimum parameters specified in Table 7.

6. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.
- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and/or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.
- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.

- F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.
- I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. The Permittee shall conduct emission testing, if requested by MassDEP, in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13. If required, a pretest protocol report shall be submitted to MassDEP at least 30 days prior to emission testing and the final test results report shall be submitted within 45 days after emission testing.
- K. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

7. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain “Fail-Safe Provisions,” which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

8. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval. Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this Plan Approval, please contact Mr. Mun Wong by telephone at 978-694-3286, or in writing at the letterhead address.

Sincerely,

This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.

Mun S. Wong
Environmental Engineer

This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.

Susan Ruch
Deputy Regional Director
Bureau of Waste Prevention

cc: Board of Health, 365 Boston Road, Billerica, MA 01821
Fire Headquarters, 8 Good Street, Billerica, MA 01821
MassDEP/Boston - Yi Tian
MassDEP/NERO – Marc Altobelli, M. Persky